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Wu

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(54) **BATTERY STAGE MODULE**

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(51) **Int. Cl.**[7] **H01R 3/00**
(52) **U.S. Cl.** **439/500**; 439/698; 429/100
(58) **Field of Search** 439/500, 698; 429/100

(56) **References Cited**

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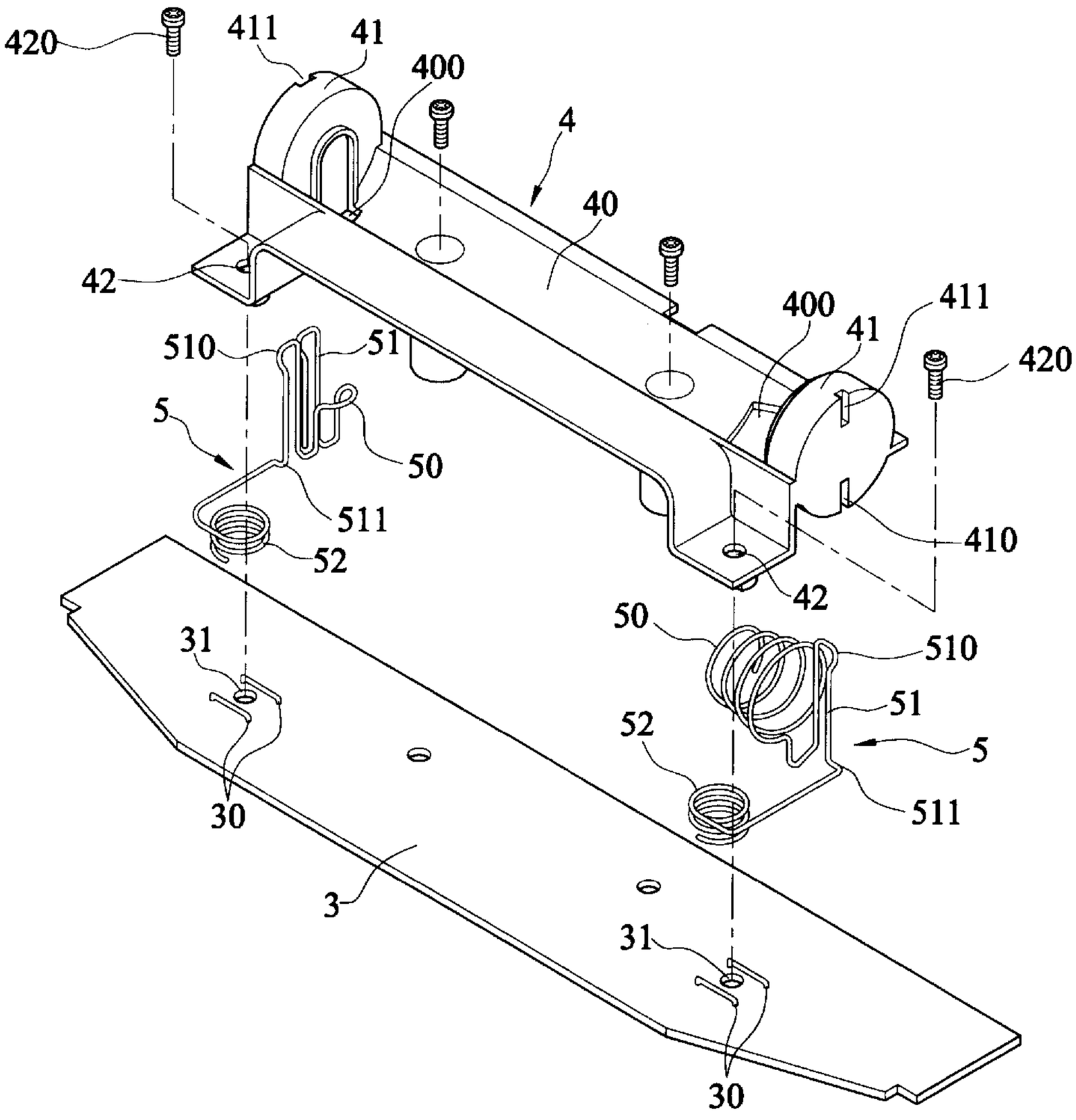
(57) **ABSTRACT**

A battery stage module comprises a battery stage with a battery chamber and two conductive members. A plurality of screws are locked to the jumper contacts of a circuit board and clamps the battery stage module to the circuit board. Each conductive member comprises at least one first spring and a second spring wherein the first spring is in contact with poles of battery and the second spring is located on bottom of the battery stage and is penetrated by the screw. The second spring is forced to touch the jumper contacts of the circuit board when the battery stage module is fixed on the circuit board by screws.

6 Claims, 6 Drawing Sheets



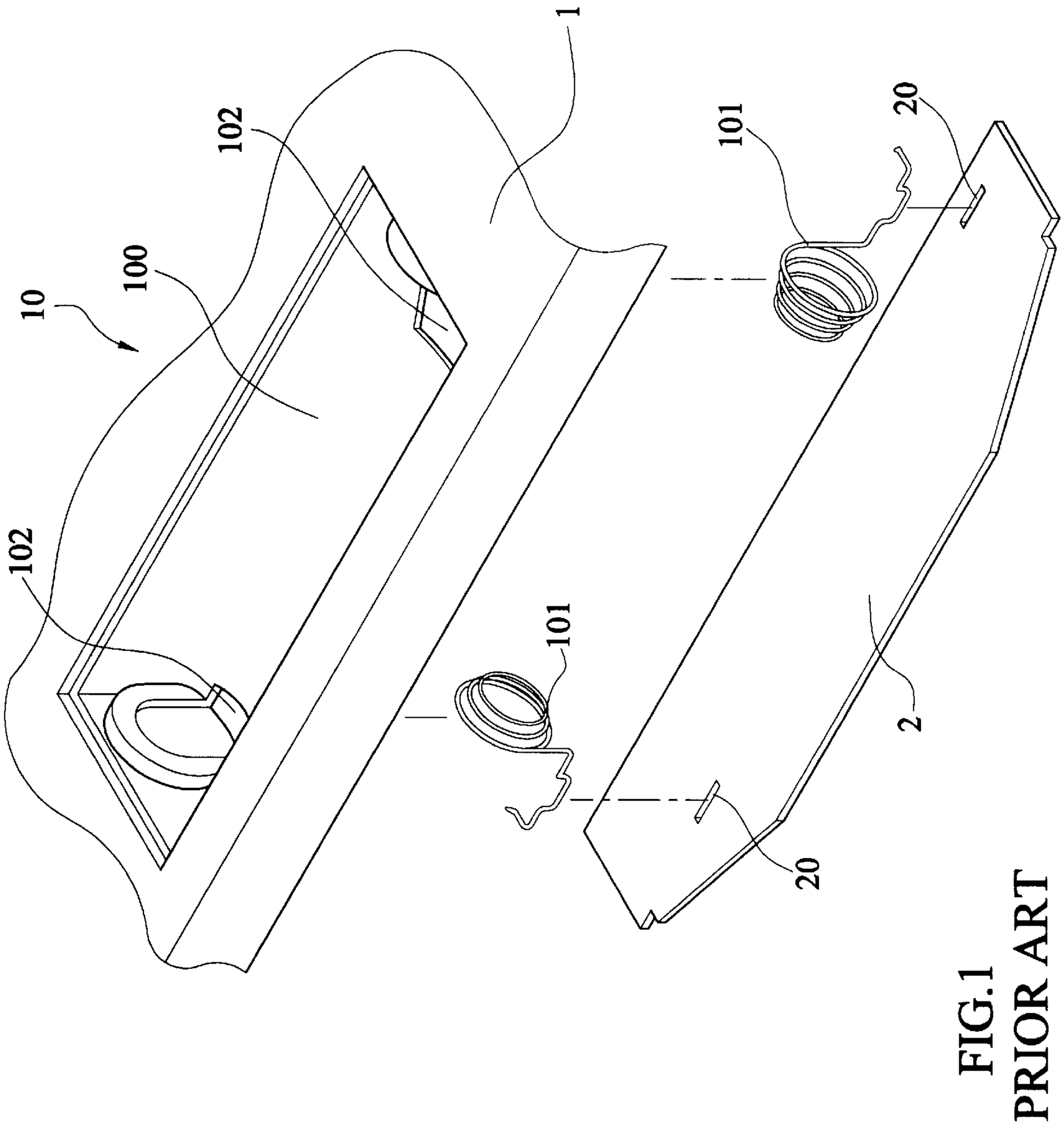


FIG.1
PRIOR ART

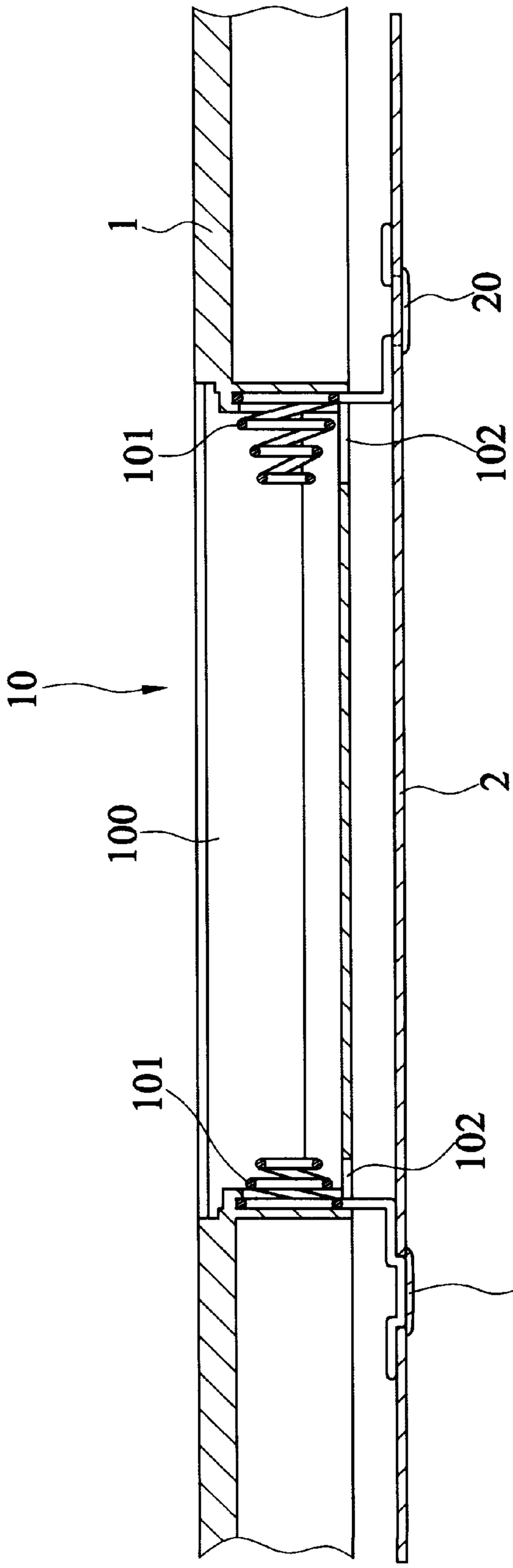


FIG.2
PRIOR ART

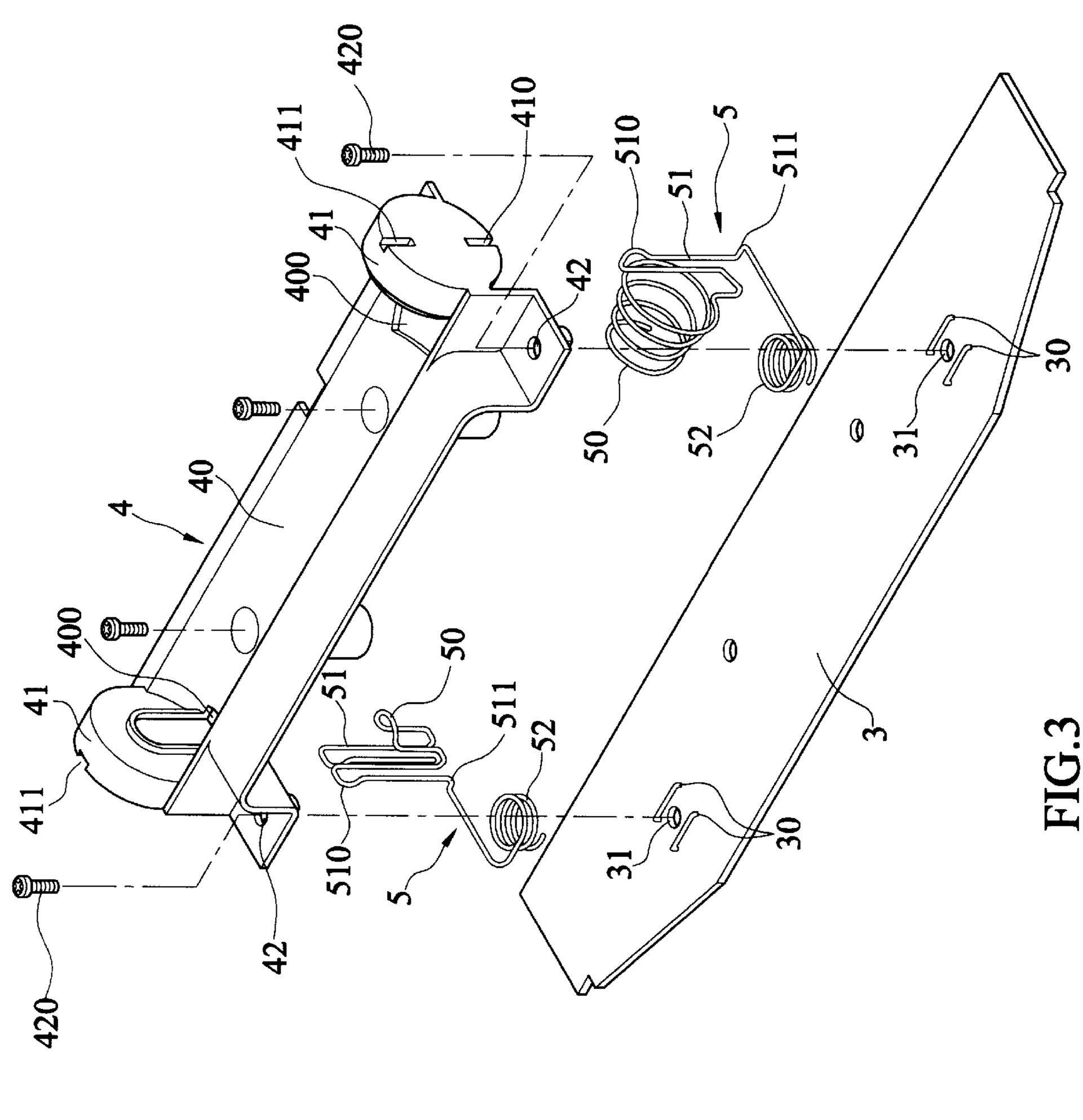


FIG.3

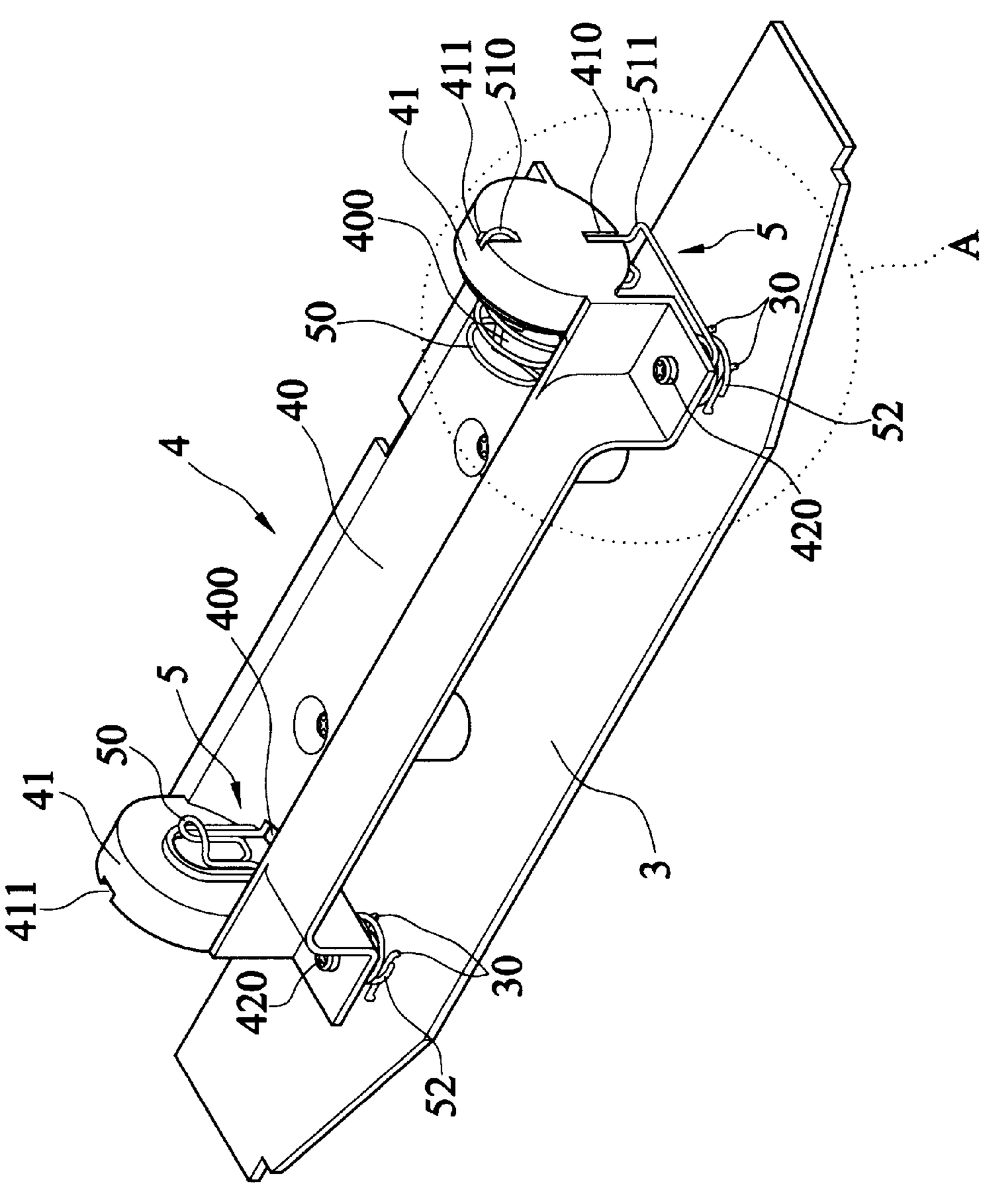

4
400
5
50
41
411
420
52
30
3
40
400
50
5
41
411
510
410
511
A
30
52
420

FIG.4

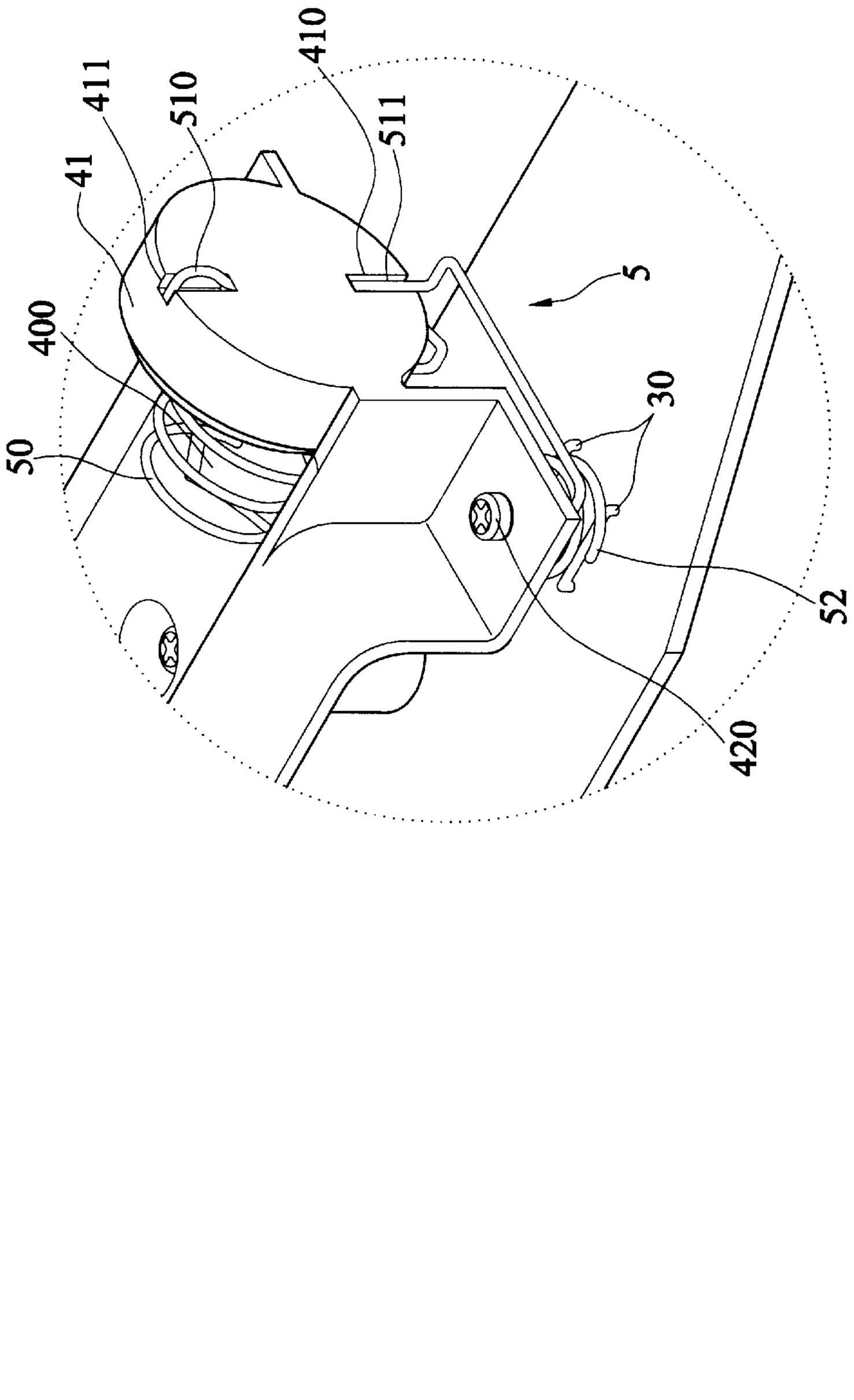


FIG.4A

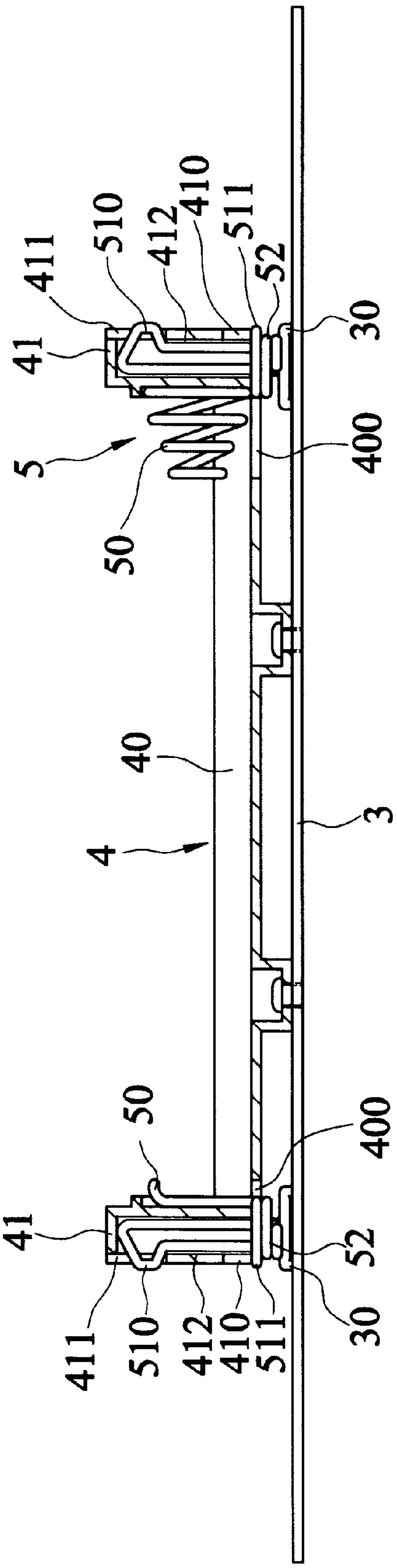

411
510
412
410
511
52
30
41
5
50
400
40
4
3
50
400
41
52
411
510
412
410
511
30

FIG.5

BATTERY STAGE MODULE

FIELD OF THE INVENTION

The present invention relates to a battery stage module, especially to a battery stage module, which has simple structure and easy assembling.

BACKGROUND IF THE INVENTION

The conventional consumer electronic devices using battery as primary or auxiliary power source generally has battery stage **10** arranged on a case **1** thereof and having a battery chamber **100**, as shown in FIG. **1**. The battery chamber **100** has two conductive members **101** in metal spring or tongue forms on both sides thereof and connected to positive and negative poles of battery. As shown in FIG. **2**, the conductive members **101** are fixed to corresponding contacts **20** on a circuit board **2** to provide connection between the battery and the circuit board **2**.

The battery stage **10** is generally integrally formed on the case **1** and the conductive members **101** are soldered to the contacts **20** on the circuit board **2** or connected to the contacts **20** through wiring in advance. The conductive members **101** pass through corresponding through holes **102** on both sides of the battery chamber **100** and are clamped by the through holes **102** when the circuit board **2** is assembled to the case **1**. The soldering and wiring task for the conductive members **101** are cumbersome and the conductive members **101** cannot be firmly assembled to the case **1**. Therefore, the cost is increased and the yield is reduced.

It is the object of the invention to provide a battery stage module, which has simple structure and easy assembling.

In one aspect of the invention, two conductive elements contacting the poles of the battery is assembled on a battery stage in advance to form a battery stage module. The conductive elements are also in contact with contacts on a circuit board when the battery stage module is assembled to the circuit board.

In another of the invention, each conductive element comprises a first spring and a second spring formed by bending a metal wire. The first spring is assembled to two lengthwise ends of a battery chamber to touch the poles of the battery. The second spring is arranged beside the jumper contacts of the circuit board. The second spring is in contact with the jumper contacts of the circuit board by a clamping means.

The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded view of a prior art battery stage;

FIG. **2** is a sectional view of the prior art battery stage;

FIG. **3** is an exploded view of the present invention;

FIG. **4** is a perspective view of the present invention;

FIG. **4A** is a partially enlarged view of portion A in FIG. **4**;

FIG. **5** is a sectional view of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to FIGS. **3** and **4**, the present invention provides a battery stage module, which is assembled on a circuit board **3** of a consumer electronic device and can be the primary or auxiliary power source of the consumer electronic device.

The battery stage module comprises a battery stage **4** and two conductive members **5**. The battery stage **4** has a battery chamber **40** to receive battery. The battery chamber **40** has two end walls **41** and two through holes **400** on bottom thereof and beside the end walls **41**. The end wall **41** has an upper slit **411** and a lower slit **410** and a groove **412** between the upper slit **411** and the lower slit **410**, as shown in FIG. **5**. Moreover, the battery stage **4** has a plurality of thread hole **42** at locations corresponding to thread hole **31** and jumper contacts **30** on the circuit board **3**. A clamping means such as screws **420** are tighten through the thread hole **42** to clamp the battery stage **4** on the circuit board **3**.

Each conductive member **5** is formed by bending a metal wire and comprises a first spring **50**, a clamping arm **51** and a second spring **52**. As shown in FIGS. **4**, **4A**, **5**, each first spring **50** passes through the through hole **400** and abuts on one end wall **41** such that the poles of the battery can be in contact with the first spring **50** when being inserted into the battery chamber **40**. The clamping arm **51** is inserted into the groove **412** and an upper clamping part **510** on top of the clamping arm **51** and a lower clamping part **511** on bottom of the clamping arm **51** are engaged into the upper slit **411** and the lower slit **410**, respectively. Therefore, the second spring **52** is fixed to the bottom of the thread hole **42** and is penetrated by the screw **420**.

The above-mentioned battery stage **4** can be individually prepared and easily assembled on the circuit board **3** by screw **420**. In other word, the operator tights the screw **420** into the thread hole **31** between the jumper contacts **30** to lock the battery stage **4** on the circuit board **3**. More particularly, the second spring **52** is forced to touch the jumper contacts **30** during the tightening procedure.

In other word, after preparing the battery stage **4** in modular fashion, both the battery stage **4** and the conductive member **5** can be assembled on the circuit board **3** by simply tightening the screw **420**. The cumbersome, reflow soldering and wiring are omitted. The second spring **52** of the conductive member **5** can be firmly assembled to the jumper contacts **30** by the tightening of the screw **420**. The second spring **52** is penetrated and retained by the screw **420**, therefore, the second spring **52** will not drop from the battery stage module.

Although the present invention has been described with reference to the preferred embodiment thereof, it will be understood that the invention is not limited to the details thereof. Various substitutions and modifications have suggested in the foregoing description, and other will occur to those of ordinary skill in the art. Therefore, all such substitutions and modifications are intended to be embraced within the scope of the invention as defined in the appended claims.

I claim:

1. A battery stage module arranged on a circuit board and adapted for consumer electronic devices; the battery stage module comprising:

a battery stage having a battery chamber for receiving a battery;

two clamping means arranged on the battery stage, each of said clamping means adjacent two jumper contacts on the circuit board; the clamping means clamping the battery stage to the circuit board;

two conductive elements each having a first elastic part formed with a second elastic part each of the first elastic

parts located at a bottom of the battery chamber and contacting respective poles of the battery each of the second elastic parts located at a bottom of the battery stage and aligned with each of the clamping means, each of the second elastic parts touching the jumper contacts on the circuit board when the clamping means clamp the battery stage on the circuit board.

2. The battery stage module as in claim **1**, wherein each of the conductive elements is formed by bending a metal wire; and the first elastic part and the second elastic part of each of said conductive elements are formed as spring shape.

3. The battery stage module as in claim **1**, wherein the clamping means is a screw and the battery stage and the circuit board have thread holes adapted to receive the screw.

4. The battery stage module as in claim **1**, wherein the battery chamber has two end walls and has a through hole near the end wall to allow passing of the first elastic part.

5. The battery stage module as in claim **4**, wherein a clamping arm is formed between each of the first and second elastic parts, the battery chamber having two grooves aligned to the clamping arm on a bottom of the end wall.

6. The battery stage module as in claim **5**, wherein the clamping art has an upper clamping part extending outward and the top of the groove has an upper slit engaged with the upper clamping part.

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